APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER
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ART UNIT	PAPER NUMBER
2622	

DATE MAILED: 05/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>20 March 2006</u>.

2a)☒ This action is **FINAL.**   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>5,7,8,13 and 15-20</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>5,7,8,13 and 15-20</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Response to Arguments

1.   Applicants' arguments filed 3/20/2006 have been fully considered but they are

not persuasive.

With respect to claims 5 & 13, the Applicants argue:

(i) Bilhan does not describe or suggest the black reference level is a moving

average of the black reference values for the plurality of lines. There is no disclosure

that the differential values of a plurality of lines are stored in the register and a moving

average is taken of the differential values (remarks, page 8).

(ii) Nowhere does Bilhan describe that moving average filter scheme described in

col. 4 of Bilhan averages a plurality of lines, the moving average being obtained from

moving-averaging in a sub-scan direction as described in claim 5 (remarks, page 8).

(iii) The outstanding rejection also appears to clearly be an improper hindsight

reconstruction of Applicants' invention based only on Applicants' own disclosure, and

not on any teachings in the prior art. The obviousness in light of flexibility of Bilhan

does not appear to be based on any proper basis for a rejection (remarks, page 9).

In response, the Examiner respectfully disagrees for the corresponding reasons:

(i) Bilhan does disclose that the black reference level is a moving average of the

black reference values for the plurality of lines. In both first and second embodiments,

Bilhan clearly discloses, "This circuit 500 provides CCD signal processing method for

optical black offset correction using a moving average filter scheme such that the optical

black pixels are averaged at the beginning of each line and the offset is canceled." (col.

4, lines 22-25), and "The second embodiment provides optical black offset correction using <u>a moving average filter scheme</u> such that the optical black pixels are averaged at the beginning of each line and offset DACs, DAC-C 714 and ADC-F 716, are updated in order to cancel the offset. A digital block takes the average of the ADC outputs for optical black level and controls the DACs, 728 and 730, in order to compensate for the channel offset and optical black correction." (col. 4, line 66 – col. 5, line 6). Furthermore, Bilhan discloses, "For each line, ADC 710 outputs a signal corresponding to the sampled optical black levels which are averaged by the digital block. <u>The user can program the number of optical black cells per line and the number of lines to be averaged by calibration logic 714.</u>" (col. 5, lines 45-50). As seen from Bilhan's disclosure, the black reference level is a moving average of the black reference values (black cells per line) for the plurality of lines (a number of lines being programmed). Even though Bilhan does not describe that the differential values of a plurality of lines are stored in the registers 722 & 726 and a moving average is taken of the differential values, the claimed limitations are sufficiently met by the mentioned disclosure above because the claims <u>do not</u> require <u>moving averaging</u> of <u>average</u> of black reference values.

(ii) As addressed above, the moving average filter scheme disclosed by Bilhan clearly averages a plurality of lines. Although Bilhan does not explicitly disclose the term "a sub-scan direction" such that the moving average being obtained from moving-averaging in a sub-scan direction, Bilhan describes that CCD images are shifted vertically to line register, then the pixels on this line are shifted horizontally to an output

pin (col. 5, lines 43-45 and operation timing shown in Fig. 6) where the black correction

to be performed. One skill in the art would quickly recognize the vertical scan direction

being equivalent to the claimed sub-scan direction as stated in the Office Action mailed

12/20/2005.

(iii) The obviousness rejection is established on the basis of Bilhan's disclosure in

col. 5, lines 43-50, wherein the user can program the number of optical black cells per

line and the number of lines to be averaged for a CCD imager operated by vertical and

horizontal scanning method. Further support for obviousness rejection is found in **col.**

7, lines 22-36 in which Bilhan teaches advantages of digitally programmed black

correction logic by disclosing "The advantages of the optical black correction apparatus

includes but is not limited to a digitally programmable filter as opposed to an analog

capacitor based integrator. **Depending on the noise of the CCD, scan time, and**

other variables, the response time and filter bandwidth for the optical black

correction can be digitally programmed. This architecture provides significant

advantages over conventional architectures including digital programmability,

fine resolution, and compatibility for both continuous time and discrete time

programmable gain amplifiers. The present invention finds application in a great

many video systems including digital still cameras, digital video cameras, digital video

processing systems, CCD signal processors, and CMOS imagers, in a variety of

industrial, medical, and military sensor and imaging applications." Therefore, it cannot

be said that the rejection is based on an improper hindsight reconstruction of

Applicants' invention.

For claims 7 & 15, the limitation "the black reference level for each line is

obtained from moving-averaging the black reference values for the plurality of lines" is

also addressed by the Examiner's response above.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2.   Claims 7 & 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Bilhan

et al (US 6,791,607).

Regarding claim 7, Bilhan discloses an image reading apparatus (Figs. 5 & 7 and

abstract) comprising:

photoelectric conversion means (CCD) for photoelectrically converting image

information obtained from optically reading an original image, line by line, and outputting

an image signal, the photoelectrically converting means having optically shielding

means (optical black pixels) provided at a portion thereof (see Fig. 6 and col. 4, lines

20-40);

black shading correction means (circuitry shown in Figs. 5 & 7) for correcting the

image signal using a black reference level ($OB_{average}$ output from digital average 512 or

logic 714), the black reference level being obtained from the portion of the electrically

converting means for each line during an operation of the reading of the original image,

wherein the black reference level used by the black shading correcting means for each

line is obtained using black reference values (values of optical black pixels), each of the

black reference values being data of the portion of the photoelectrically converting

means for a respective one of a plurality of lines, wherein the black reference level for

each line ($OB_{average}$ output from digital average 512 or logic 714) is obtained from a

moving-averaging of the black reference values (values of optical black pixels) for the

plurality of lines. See col. 4, line 66 – col. 5, line 67.

Regarding claim 15, see the Examiner's analysis in claim 7.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

3.   Claims 5 & 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Bilhan et al (US 6,791,607).

Regarding claim 5, Bilhan discloses all limitations of claim 5 (see the analysis of claim 7 for the same limitations) but does not clearly disclose that the black reference level for a respective line is an average of pixel values in a main scan direction, the moving average being obtained from moving-averaging in a sub-scan direction, the black reference values. However, Bilhan clearly suggests that **the user can program the number of black cells per line and the number of lines to be averaged by calibration logic 714 (col. 5, lines 48-50).** Bilhan also teaches scanning of the CCD sensor by horizontal and vertical scanning method in col. 5, lines 43-45. From the technical view, a main scan direction is represented by the horizontal scan direction and a sub-scan direction is presented by the vertical scan direction. Bilhan further teaches that for each line, ADC 710 outputs a signal corresponding to the sampled optical black levels which are averaged by the digital block (col. 5, lines 46-48).

Therefore, it would have been obvious to one of ordinary skill in the art to quickly recognize the scanning directions to take the advantage of digitally programmed logic circuit used in Bilhan **to program** the imaging apparatus such that the black reference level for a respective line is an average of pixel values (average of the number of black pixels per line) in a main scan direction (horizontal direction) and the moving-averaging is obtained from moving-averaging (average of the number of lines), in a sub-scan direction (vertical direction), the black reference values so as to compensate noise of the CCD, scan time and other variables as suggested by **Bilhan in col. 7, lines 22-48.**

Regarding claim 13, see the Examiner's analysis in claim 5.

4.   Claims 8, 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Bilhan et al (US 6,791,607) in view of Barron et al (US 5,659,355).

        Regarding claim 8, Bilhan teaches that the imaging apparatus is highly

programmable and the user can program *the optical black pixels per line* and *the*

number of lines to be averaged by calibration logic 714 (col. 5, lines 46-50). However,

Bilhan is *silent* about the number of lines comprising the current line and preceding

lines. Barron teaches averaging of black reference values by using a plurality of lines

that comprises the current line and preceding lines (e.g., first 4 lines including preceding

3 lines and current 4th line, or first 8 lines including preceding 7 lines and current 8th line,

etc...) so that a more accurate calculation for black level compensation is established.

See Barron in col. 3, line 60 – col. 4, line 23.

        Therefore, it would have been obvious to one of ordinary skill in the art to

program the imaging apparatus in Bilhan to average a predetermined number of lines

that comprises the current line and preceding lines to obtain a more accurate calculation

for the black level correction.

        Regarding claim 16, see the Examiner's analysis in claim 8.

        Regarding claims 17-20, see the Examiner's analysis in claim 8. Furthermore,

the combined teachings of Bilhan and Barron would also teach that the data of the

predetermined number of immediately antecedent lines comprising an average taken

through a relevant line since optical black pixels in each line are averaged in the main

scan direction before the total number of lines to be averaged again in the sub-scan

direction as analyzed in claim 5 (see Bilhan in col. 4, line 66 – col. 5, line 2 and col. 5,

lines 46-50).

Conclusion

5.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Nhan T. Tran whose telephone number is (571) 272-

7371. The examiner can normally be reached on Monday - Thursday, 7:30am -

5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Ometz can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

NT.

DAVID OMETZ
SUPERVISORY PATENT EXAMINER